looking about for the best university or library in which to deposit their own scientific collections. If the wants of our universities and observatories and research stations could be fully made known, *through the columns of* Science, they would find a ready response on the part of individuals who have been profiting by the generous distribution of expensive volumes during many years past. Such volumes, whether published by the government or by societies, are, as it were, loaned in trust to past recipients, who, having benefited by them, should now in turn pass them on to others, rather than hoard them, or sell them as merchandise.

Cleveland Abbe.

THE MENTAL DEVELOPMENT OF INDIVIDUALS.

To the Editor of Science: I wish to learn at what age, under what circumstances and to what extent people of different climes, races, civilizations and temperaments have changed their views as to whence we came, whither we go, and what we are here for. Any statement, elaborate or short, regarding an individual's mental development will be a welcome contribution to a proposed 'Natural History of the Thinker.' I have been obliged to thus appeal to my contemporaries because autobiographical documents so far extant do not yield enough accurate descriptions of the inner life. To illustrate my purpose, I beg to refer to my article on 'The Interpretation of a System from the Point of View of Developmental Psychology,' in the *Journal of Philosophy, Psychology and Scientific Methods,* February 15.

Edwin Tausch.

Ohio University, Athens, O.

SPECIAL ARTICLES.

QUARTZ GLASS.

Pure quartz when melted down to a glass has three properties which make it of immense value in the chemical and physical laboratory, and were it not for the technical difficulties attending its production, it would certainly displace ordinary glass wherever a transparent medium capable of withstanding heat is required. It expands less than one tenth as much as common glass when heated; it can be heated to 1,000° C. without softening; and finally, it transmits ultraviolet light freely.

It has not proved easy to make quartz glass, even in small quantities in the laboratory. Quartz is one of those peculiar minerals[1] which show no sharp melting temperature, but soften very gradually, and when pure, never become thin liquids, even at the temperature of the electric arc. Furthermore, quartz begins to vaporize rapidly in air at about the temperature of melting platinum, while it is still much too viscous to release the included bubbles. A mass of quartz fragments, when melted in air in the electric furnace, comes out resembling solidified sea-foam or volcanic pumice. It is quite opaque, dirty and useless for mechanical or optical purposes, and very persistent efforts in a number of laboratories have so far failed to produce a clear product except from single fragments treated individually. Small globules of glass can be obtained from single crystals, pieced together in the oxyhydrogen flame, and blown into thin quartz glass vessels such as are now in quite common use. Discs suitable for small lenses have also been obtained at Jena by heating small clear crystals with such rapidity as to produce a thin enclosing film of liquid before cracks develop in the body of the crystal, thereby preventing the entrance and subsequent enclosure of air. It is, of course, plain that such devices can have but limited usefulness. We must somehow manage to melt larger masses of random fragments to a clear glass before the technical problem can be regarded as solved.

This problem is somewhat outside the proper scope of the Geophysical Laboratory, but our plant is perhaps better adapted to its solution than most others, and the demand for clear quartz glass is so general that it seemed best to spend a limited time in an effort to find the difficulty and to try to ascertain the direction in which the solution lies. No effort at refinement of method has yet been made.

[1] See Day and Allen, 'The Isomorphism and Thermal Properties of the Feldspars,' Publ. 31, Carnegie Institution.